

REMARKS

Applicant has considered the outstanding official action. It is respectfully submitted that all the claims are directed to patentable subject matter as set forth below.

Restriction has been required under 35 U.S.C. §121 as between Group I, claims 37-44, drawn to apparatus, and Group II, claims 21, 45 and 46, drawn to product. Applicant confirms the telephone election of Group I, claims 37-44. The non-elected claims 21, 45 and 46 have been canceled. However, applicant reserves the right to file a divisional application including claims directed to the non-elected subject matter.

Claims 37-44 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite based on the language in claim 37, line 11, "a molten state".

Applicant notes that "molten" is equated to "plastic" or "plasticized" in the specification, e.g. see page 19, first paragraph. Applicant has amended claim 37 to refer to "plastic deformation of internal body structure". Claim 37 overall has been amended to claim the "residual plastic deformation of the internal body structure having a favorable residual stress pattern in the body structure". Support is present in the specification at, for example,

page 11, last paragraph; page 12, first paragraph; page 14, fourth and last paragraphs; page 19, first paragraph; and page 32, first paragraph. Applicant respectfully submits that the claims are definite and request withdrawal of the §112 rejection.

The outstanding rejections based on prior art are as follows:

- (1) Claims 37, 42, 43 and 44 under 35 U.S.C. §103(a) over U.S. Patent No. 3,650,016 (McMaster); and
- (2) Claims 38, 40 and 41 under 35 U.S.C. §103(a) over McMaster as applied above and further in view of U.S. Patent No. 5,035,142 (Dryga).

Claim 37 is the sole pending independent claim.

Claim 39 (which is dependent on independent claim 37) is stated to be allowable if rewritten to overcome the §112 rejection. Applicant has not rewritten claim 39 at this time since applicant submits that base claim 37 is also directed to patentable subject matter. Claim 37 has been amended to overcome the §112 rejection. Thus, applicant submits that claim 39 has overcome the §112 rejection.

The claimed invention is directed to apparatus for impact treatment of product bodies comprising in combination a source of repetitive impulse energy, and a transducer adapted to introduce pulse energy from the source by mechanical contact at an external body surface to generate

in an interior zone of a body structure corresponding compression wave energy that provides residual plastic deformation of internal body structure having a favorable residual stress pattern in the body structure. The zone thus has restructured body characteristics presenting reduced structural defects and reduced residual stresses.

McMaster teaches a source of vibratory-mechanical energy and transducer for transmitting energy from the source via a stationary coupling or concentrator to a bolt or other type of threaded fastener in order to cause the bolt to vibrate at its natural frequency to increase and decrease the bolt in length. The bolt is then tightened using finger pressure. Thus, the apparatus taught in McMaster requires steady and continuous contact to a fixed point on a work product. The vibratory treatment of McMaster creates tensile stresses only. Applicant's claimed invention is based on impulse energy at an external body surface to generate in an interior zone of the solid body compression wave energy to provide residual plastic deformation having a favorable residual stress pattern in the body structure. Thus, the energy-carrying components taught in McMaster are resonance concentrators of oscillating velocity, whereas the claimed invention provides non-resonance energy, i.e., pulse or impact energy. Due to the apparatus providing pulse energy, the apparatus can move

freely relative to the surface of a work product and its operation is not based on contact ultrasonic excitation but rather on pulse or impact interaction with the treated surface in any required point of the surface. Thus, McMaster does not teach applicant's claimed invention. Further, no suggestion is provided by McMaster which would motivate one skilled in the art to modify McMaster in order to obtain applicant's claimed invention. Withdrawal of the §103 rejection based on McMaster is respectfully requested.

As to the rejection based on McMaster in combination with the secondary reference Dryga, applicant respectfully submits that Dryga does not make up for the shortcomings of McMaster as set forth above. Dryga teaches apparatus for vibratory treatment of workpieces wherein the apparatus is rigidly secured to a workpiece and remains stationary during treatment. The apparatus relies on measurement and the tuning of the vibrations to natural (and thus low) frequency of the structure being treated. Applicant's claimed invention is not concerned with natural frequency and resonance vibrating but rather with impulse energy and compression wave energy. Accordingly, Dryga also does not teach applicant's claimed invention. Further in view of each of McMaster and Dryga teaching away from the invention, it is respectfully submitted that no suggestion is provided to modify the teachings of the applied


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references in order to obtain the claimed invention.
Withdrawal of the §103 rejection based on McMaster and Dryga
is respectfully requested.

Reconsideration and allowance of the claims is
respectfully urged.

Respectfully submitted,

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